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ABSTRACT

As part of the activities related to the development and evaluation of a comprehensive guidance system. geared primarily to systems of individualized education now being implemented, an experimental investigation was initiated in an attempt to meet a postulated cluster of student orientation needs associated with successful adaptation to such a system. Involving students from two grade levels, two orientation programs were formulated. Results failed to support the major hypothesis that students exposed to a comprehensive orientation program would perform more effectively in the system, possess greater knowledge of the system, and exhibit more favorable attitudes toward it than students exposed to a very brief orientation program. The primary value of the investigation and its results was to point out both positive and negative features of past and current research regarding the orientation of students to educational innovations in general. (KJ)

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ORIENTING STUDENTS TO AN INDIVIDUALIZED EDUCATIONAL SYSTEM OF THE '70's

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Comprehensive Guidance System

Since May of 1968, the staff of the Guidance Research Program at the American Institutes for Research has been engaged in efforts related to the development and evaluation of a comprehensive guidance system. Designed primarily to be an integral part of an individualized system of education, support for these efforts has come from a grant to John C. Flanagan from the Division of Comprehensive and Vocational Education Research, U. S. Office of Education. In attempting this somewhat prodigious task, we have tried to adopt a four phase approach which has its roots in the recent applications of systems concepts and techniques to educational problems (Jones and Nelson, 1969). Briefly these phases involve identifying the guidance needs of the students to be served by the guidance system, specifying common and unique elements in the needs thus identified and concurrently ways through which these needs might be fulfilled, implementing these methods through utilization of a number of specific techniques and methods under circumstances which are closely monitored to minimize failure of the techniques due to improper implementation procedures, and evaluating through research and assessment activities the degree to which the needs of each student being served are met. A study of guidance research literature, guidance programs currently functioning, and students themselves seems to indicate the existence of clusters of guidance needs which seem to be shared by a large proportion of students. These commonalities in student needs have contributed to the formulation of the 12 components currently included in the comprehensive guidance system (Jones and Nelson, 1970). Assisting students to meet one such cluster of guidance needs is the aim of a system component designated as "Orientation-in" (Nelson

and Jones, 1970). Here each student is to be assisted in acquiring the various information, overt behaviors, attitudes, and other characteristics he needs to function successfully in not only the educational program to which he is exposed but also in the specific school setting in which the program is operated.

Orientation-In: A Quasi-Experimental Study

A major activity related to the exploration of this component was a quasi-experimental investigation carried out in the fall of 1968 (Jones, Kratochvil, Nelson, and Stilwell, 1969). One-hundred-fourteen ninth-grade students in two schools and one-hundred-sixty-five fifth-grade students from four schools participated. All of these students had been randomly selected for enrollment in Project PLAN, a computer supported individualized education program currently under joint development by American Institutes for Research, Westinghouse Learning Corporation, and 14 cooperating school districts. Substantial evidence accumulated from the observation of school personnel and field contacts during the first year of the project's operation (1967-1968) suggested that the students were in rather desperate need of some carefully designed orientation experiences. It was asserted that the orientation needs of students placed for the first time in an individualized system of education were far more pronounced than the analagous needs to be found in a conventional system of education. On the basis of these rather soft but undeniably extensive data, an attempt was made to explore methods for fulfilling the orientation needs of these students.

Procedures. Two orientation programs were produced at each of the two grade levels under investigation. These materials consisted of teaching-learning units (TLU's) composed of a guide that suggested what students might do and use to achieve the instructional objectives of the orientation program.

These objectives were sequenced in a manner such that students proceeded from an introduction to the new educational program, to learning the specific behaviors needed to function in the system, through the individual planning and scheduling of the work they were going to undertake in each of the subject matter areas in which they were enrolled. Designated as the comprehensive and brief versions of orientation, the two orientation programs differed in two major respects. First, in the brief version the amount of information and the amount of practice of behaviors necessary for successful functioning in the system were substantially less than the amount included in the comprehensive version. The second major difference was that the brief version allowed each student less opportunity for active participation in the decisions regarding the amount of work he was going to attempt in each subject matter area and the way it would be sequenced.

Nine criterion measures were formulated from a study of the instructional objectives of the orientation material and each dependent variable was keyed directly to at least one instructional objective. A form of each instrument was developed for each of the two grade levels involved. These devices included multiple choice tests to assess each student's knowledge of the educational program, a survey test administered at a later date to ascertain retention and subsequent acquisition of this knowledge, and an opinion survey designed to tap students' expressed opinions toward the educational program. Structured interviews were used to elicit from students their understanding of concepts and procedures necessary to function effectively in the system. Finally, precise records were kept regarding the amount and quality of the academic performance of each student. Students were randomly assigned regardless of sex to either the comprehensive or the brief orientation program. On each of the nine dependent variables at each of two grade levels, a three-way (treatment x sex x school) analysis of variance with unequal cell size was used in data analysis.

Results and Discussion. In only 2 of 18 F-tests did the main effect of treatment reach a desired level of significance. The students assigned to the comprehensive orientation program performed better on one of the multiple choice knowledge tests at the secondary level and on the other knowledge test at the intermediate level than did students assigned the brief program. With respect to the sex of the subjects, a main effect at a desired level of significance was attained in 5 of 18 F-tests. Female subjects at the intermediate level performed better on one of the knowledge tests and had more favorable opinions toward the educational system than did comparable males. Conversely, males at the secondary level performed at a higher level during the structured interviews and completed more academic work in science and social studies than did females at the secondary level. The main effect most frequently reaching a desired level of significance was the school effect wherein 12 of 18 F-tests were judged significant. The order of effect among schools was rather stable both with respect to the school scoring highest and the school scoring lowest on each of the criteria.

One readily can see that the results of this study provided little support for the major hypothesis that students participating in a comprehensive orientation program would perform better academically, or have more knowledge of, and more favorable attitudes toward, the educational system than students who participated in a brief orientation program. In only two of the instances, both knowledge tests, did the major hypothesis receive support. It should be noted that in both cases these criteria reflected students' knowledge of the educational system on a short term basis. The most obvious pattern connecting the five instances in which the main effect of sex reached a desired level of significance was that, when males performed better, it was always at the secondary level and, when the females performed better than males, it was at the intermediate academic level. It is difficult to find in these results patterns and

trends which would lend themselves to clear interpretation. It would appear that the greatest value issuing from both the study and its results lies in the implications which can be derived from them relative to a larger area of research (i.e., orienting students to educational systems and programs.

Orienting Students to Educational Systems and Innovations

This is, to our knowledge, the first experimental study dealing with orientation procedures in an individualized educational system. This would seem to call attention to a dearth of knowledge in a vital area of educational research. While considerable research is being devoted to orienting men to machine systems, occupational settings and duties, and exotic environments, little concern seems manifested in regard to assisting students to acclimatize and adjust themselves successfully to divergent educational environments and demands upon their behavioral repertoires. The lack of knowledge concerning what assistance students need in coping with the introduction to individualized systems of instruction is a representative example of this deficit. Such a state of affairs may be a result of a perception perhaps widely held, that individualized systems of instruction and educational innovations of a similar ilk are still ideas which receive lip service from educators and some attention from researchers but, as yet, are little known in operational reality. While it is unquestionably true that such innovations usually are advocated and pilot tested long before they are implemented on any significant scale, as we enter the 1970's, we see a ferment in education which in most areas of the country is not limited to verbal imperatives but which extends to actual practice in the schools. With respect to instructional settings and procedures, the proposals and projections illustrating what individualized education will and should be

like (Silberman and Carter, 1965; Morgan and Bushnell, 1966) are now accompanied by actual attempts at implementing such systems. Project PLAN, the IPI system developed at the University of Pittsburgh, and efforts such as those at Nova, Florida are representative examples of such a trend.

Thus, a variety of educational innovations rapidly are becoming operational with little concomittant research-based knowledge about how students can best be assisted to meet and cope successfully with such innovations. Such a situation might have at least two major ramifications. First, we may be missing an opportunity to contribute to the success of these educational innovations. A fine program or procedure can fail or be severely restricted in the number and variety of students it can serve effectively if these students cannot for some reason adapt or acclimatize themselves to it. Providing the students with the behaviors, attitudes, and so forth, that are requisite to operating effectively in a new setting under new procedures, or with unfamiliar materials, might both heighten the effectiveness of a particular innovation with particular students and extend some degree of positive effect to students not otherwise so benefited. Secondly, an opportunity may be missed by guidance researchers to enhance and protect the individuality of such students. Greater effort in the area of orienting students to educational innovations may result in important findings relative to more appropriate placement of students with different characteristics in divergent educational settings and systems where they will flourish best. It may be found that the demands placed on some students by particular programs or procedures are detrimental to them. The responses, for example, considered as appropriate in individualized systems of instruction such as PLAN are quite different from many of those considered desirable and adequate in conventional systems of instruction. Perhaps there are students for whom extended training is necessary to enable them to manifest the behaviors

required by the new system or for whom such demands are detrimental emotionally. These are but two of the possible ramifications of a situation where de facto practice is edging ahead of research-based findings. Since change promises to be even more rapid and pervasive in the future than is the case presently, the student seems entitled to whatever assistance can be given to help him to use the changes in his educational life to his advantage rather than being a "victim" of change.

A concern closely allied to that of the above is derived from the predominance of college and university levels of education as the site of orientation research. In relative comparison to higher education, precious little effort regarding optimal strategies for orienting students to educational programs and procedures has been expended at the primary, intermediate, and secondary levels of education. Ironically, it appears that this emphasis is misplaced for educational innovation appears to be much more pronounced at the academic levels below that of college or university. The overriding concern with orientation research in higher educational settings stems most likely from the common conception that making the transition from high school to college life is a rather serious and often potentially traumatic developmental task in the life of a young adult. Other possible contributing factors include the ready accessibility of undergraduate subjects, the higher likelihood of clean research designs, and a genuine interest in the setting on the part of the researchers involved. This latter factor may be the result of most of the personnel and funds devoted to such research being available at the university level. Regardless of contributing factors which have shaped the present situation, it appears that a re-examination is warranted of the distribution of academic levels at which orientation research studies are conducted.

Inadequacies in Research Design and Methodology

A shift in the locus and concerns of orientation research would not, however, in and of itself answer some of the basic questions regarding the need for and effect of orientation. Foremost among these, of course, is whether student orientation experiences are needed at all in particular educational settings and systems. A study of the relevant literature reveals conflicting and incomplete results on this issue. Studies can be found showing orientation to be beneficial (Gibbs, 1968; Hiehle, 1968; Miller and Ivey, 1967; O'Banion, 1969; Pappas, 1967); as having little or no effect (Cole and Ivey, 1967; Jessup, 1966; Rothman and Leonard, 1967); and perhaps even detrimental effects (Foxley, 1969). It here is asserted that resolution of such conflicting results and adequate answers to basic questions regarding the effect of orientation procedures must await improvement in the design and procedures of the orientation investigations typically conducted.

Few studies, for example, including the one described earlier, have included a true control group. In the case of the PLAN investigation, there was considerable resistance on the part of the teachers to withhold orientation assistance from some students. This resistance probably was due in large part to a strongly held belief that the students all desperately needed an orientation program. There is no opposition to such sincere concern for the students involved but it seems clear that under circumstances where control groups are not available, no definitive answer can be obtained regarding the effectiveness of a given orientation procedure. Thus a way must be devised to insure inclusion of true control groups in such studies, perhaps by promising orientation assistance to the control group students following completion of the investigation.

A second inadequacy in orientation investigations and one which also is closely related to the difficulty encountered in obtaining answers to basic questions about the efficacy of orientation experiences is insufficient data concerning the student characteristics required for success in a particular educational program and concerning the specific orientation needs of the particular students to be served. Referring again to the PLAN investigation cited earlier, various school personnel and project field consultants had asserted that the individualized instructional system and setting were demanding behaviors, knowledge, and attitudes which were not in the normal repertoire of students new to the system. Such data lack the sufficient precision necessary to formulate the specifics of an orientation program. Further, no data were available to indicate the status of each student viz. a viz. the characteristics demanded by the educational system. That is, not only must the educational innovation and setting be closely studied to ascertain just what student behaviors and other characteristics are needed to function effectively, but each student then must be assessed with regard to each of the characteristics discovered to be necessary. Thus, in this manner are the specific orientation needs of each student identified. Previous orientation studies (cf. Kiel, 1966; McCann, 1967) have often assumed the existence of student orientation needs including those labeled as academic, intellectual, social, and informational. Though in the PLAN investigation there was evidence of student orientation needs, the data were insufficiently documented. Apparently there are no published studies in which the orientation needs of the students were measured.

Before leaving this issue, it should be stressed that concern must be directed both toward an analysis of the educational innovation in question (e.g., an individualized instructional system) and to a similar analysis of the setting in which the innovation operates (e.g., the particular school).

Students who possess sufficient knowledge and skill to succeed in a very innovative system still may flounder due to some factors operating not in the instructional system per se but due to variables incorporated in the setting in which the system is operating (e.g., the teacher). Included here may be specific differences in teacher characteristics such as in the abilities requisite to managing appropriately an individualized classroom. Considerable evidence can be found in the results associated with the main effects of schools as a variable in the PLAN investigation. The identification of the characteristics requisite to effective functioning in the educational system and setting and the assessment of student needs relative to those characteristics then would provide a solid foundation on which to formulate precise instructional objectives and the orientation program itself. Just as important, they would give clear guidance as to appropriate dependent variables through which to measure the effectiveness of the orientation procedures.

The latter problem, that of designating dependent variables and formulating precise and appropriate criterion measures, is another key to improved orientation research and consequently to resolution of many of the questions surrounding it. Criterion instruments in orientation studies customarily have been weak. Often these studies have employed only one or two measures. These criteria usually have been subjective reports from students and staff (Gibbs, 1968; Hiehle, 1968; Miller and Ivey, 1967; O'Banion, 1969; Pappas, 1967). Such studies usually report orientation programs to be of substantial worth and benefit to students. Investigations such as those by Nelson (1941, 1942) improve upon such efforts to some degree by employing tests of the knowledge and attitude needs which orientation programs hope to influence. In the PLAN orientation study outlined earlier, criteria were keyed rather precisely to the instructional objectives of the orientation materials. As the knowledge, behaviors, attitudes, and other characteristics needed by students to

succeed increase in number and complexity, the necessity for a clear relatedness between orientation needs, instructional objectives, and criterion measures becomes more and more crucial to the finding of clear answers to the questions investigated. Several studies (Cole and Ivey, 1967; Jessup, 1966; Rothman and Leonard, 1967) have used rather indirect measures of orientation effectiveness, such as G.P.A., attrition rates, and changes in personal values. Since these variables have an unclear and in some cases questionable relationship to the orientation programs investigated, it is not surprising that such studies usually show no differences between those students who had been exposed to orientation procedures and those who had not.

The use of pre and post measures in orientation investigations is rather rare. An exception to this is an interesting design recently reported by Foxley (1969) at the university level in which the number of available subjects was sufficient to allow for a randomly selected group of entering freshmen students to experience the criterion measures on a pre-orientation basis and a comparable group similarly sampled, to be measured on a post-treatment basis. Such a design has the advantage of providing information on the changes wrought by the orientation procedures. However, the study again lacked a true control group and the design used does not allow the investigator to determine the particular students whose needs apparently were met by the orientation experience. That is, while changes due to orientation can be assessed with such a design, the students experiencing the pre and post measures are not the same, and therefore, the specific students experiencing the changes cannot be identified. Though in the PLAN orientation study only post treatment data were used as a result of there being no clear assessment of each student's needs, each dependent variable was closely linked to specific instructional objectives in the orientation materials. More desirable, of course, would be to gather pre and post orientation data on an identical

group of students in order to link any effects of orientation procedures to specific students and to gain some notion of the amount of changes taking place with regard to each student. Appropriate criteria in such investigations would be manifestations of those specific behaviors, knowledges, and other characteristics previously identified as being requisite to functioning effectively in the system and setting. All other criteria would seem to be less useful and in some cases irrelevant in comparison to those just mentioned.

The variation in salient teacher characteristics as a factor effecting research results was mentioned briefly at an earlier point in relation to the need for extensive analysis of the setting in which the student is operating as well as the need for study of the educational innovation to which he is being exposed. This variation in teacher characteristics (e.g., ability to manage appropriately an individualized classroom) is representative of a host of subtle factors which must either be openly studied in the research design or adequately controlled for in order to obtain clear research results. Accounting for the rather substantial main effects of school in the PLAN study, for example, might well involve a discovery that the characteristics necessary to effective administration of a PLAN classroom may not have been held to equal degrees by the participating teachers. Additionally, there are implementation weaknesses and irregularities that prove difficult to study or control. For instance, the teachers in the PLAN study might have deviated from the procedures outlined for them to use in conducting the orientation programs, such as holding discussions with students on topics designed to be covered more effectively via other methods. "Teacher-proof" or "implementation-proof" orientation programs exists only in fantasy. Thus, such factors as those mentioned above must be given design and methodological consideration.

Progress on several of the problems discussed above, however, is partially dependent upon more adequate theoretical structures and subsequent development

of rationales to undergird orientation research. At best, studies evaluating the effects of various orientation procedures have simply compared two or more programs apparently overlooking the critical necessity of linking these programs and procedures to a clear rationale. For example, what is the hypothesized relation between the implementation of a particular orientation program and the elimination of previously identified student orientation needs? What theoretical stance underlies the methods by which the student needs are identified and assessed? By giving more concern to the testing of competing rationales and theoretical structures as well as of competing procedures only, research knowledge concerning orientation programs will be placed on a more firm footing and progress toward optimal orientation procedures for students differing in characteristics promises to be much more rapid.

Summary

As part of activities related to the development and evaluation of a comprehensive guidance system, geared primarily to systems of individualized education now being implemented, an experimental investigation was initiated in an attempt to meet a postulated cluster of student orientation needs associated with successful adaptation to such a system. This investigation apparently was the first to experimentally examine orientation procedures in individualized educational programs. Involving students from two grade levels, two orientation programs were formulated. Results failed to support the major hypothesis that students exposed to a comprehensive orientation program would perform more effectively in the system, possess greater knowledge of the system, and exhibit more favorable attitudes toward it than students exposed to a very brief orientation program. The primary value of the investigation and its results was to point out both positive and negative features of past and current research regarding the orientation of students to educational innovations in general. Suggestions related to needed changes in the locus and quantity of such research as well as to its

design and methodology were offered. When developing and evaluating student orientation programs for any educational system or school setting, three questions seem of paramount importance and demand systematic examination. These are: (1) What student orientation needs, if any, exist? (2) How can each student's needs best be met? (3) How can the degree to which these needs are met be clearly determined? If steps are taken to answer clearly these questions, the existing confusion and conflicts surrounding the results of orientation research might well be resolved so that the procedures used in the orientation of students to innovative systems of education then could be based not on happenstance and administrative ease but on research. A wider variety of students than at present might thus benefit from innovations in education which may be implemented in the '70's. Furthermore, these students may well benefit to a greater degree from these innovations than currently would be possible.

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